



ML3 Series Ultraminiature Sensors

- Self-contained ultraminiature sensors
- Wide range of aperture attachments
- Visible red and infrared light sources
- Vertical and horizontal styles



Convergent Beam Mode

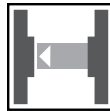
See pages 432-434

Features:

- Fixed sensing range
- Visible red or infrared LED light sources

Sensing Range: 30 mm

Outputs: NPN, PNP



Thru-Beam Mode

See pages 435-438

Features:

- Long-range scanning
- Separate transmitter and receiver housing

Sensing Range: 1.5 m

Outputs: NPN, PNP

See pages 439-440 for ML3 Series wiring and dimensions.



Convergent Beam Mode

Specifications		
SENSING RANGE	30 mm	30 mm
SENSITIVITY ADJUSTMENT	Yes	Yes
DIRECTIONAL MOUNTING	Vertical	Vertical
MODEL NUMBER(S)	ML3-8-C-30-RT/25/115/148 ⚡ ML3-8-C-30-RT/25/115/149	ML3-8-C-30-IR/25/115/148 —
OUTPUT: Transistor, /148 Open collector /149	1 NPN 1 PNP	1 NPN —
LOAD CURRENT	80 mA max.	80 mA max.
VOLTAGE DROP	1 VDC	1 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION	No	No
REVERSE POLARITY PROTECTION	Yes	Yes
SUPPLY VOLTAGE	10.8-26.4 VDC	10.8-26.4 VDC
VOLTAGE RIPPLE	10% max.	10% max.
LED(s)	Yes (1)*	Yes (1)*
CURRENT CONSUMPTION	≤ 20 mA	≤ 20 mA
OPERATING MODE	Light on	Light on
RESPONSE TIME	≤ 1 ms	≤ 1 ms
SWITCHING FREQUENCY	500 Hz	500 Hz
PROTECTION (IEC)	IP40	IP40
LIGHT SOURCE	Visible red LED	Infrared LED
AMBIENT LIGHT RESISTANCE	≤ 10,000 lux	≤ 10,000 lux
TEMPERATURE RANGE	WORKING: -4 °F to +122 °F STORAGE: -40 °F to +158 °F	WORKING: -4 °F to +122 °F STORAGE: -40 °F to +158 °F
HOUSING MATERIAL	Polycarbonate	Polycarbonate
LENS	Polycarbonate	Polycarbonate
WEIGHT	≈ 0.7 oz	≈ 0.7 oz
STANDARDS	EN 60947-5-2	EN 60947-5-2
APPROVALS	CE	CE
ELECTRICAL CONNECTION	 2-meter cable, PVC covered, 3-conductor, #28 AWG	 2-meter cable, PVC covered, 3-conductor, #28 AWG
ADDITIONAL DATA	See pages 439-440	

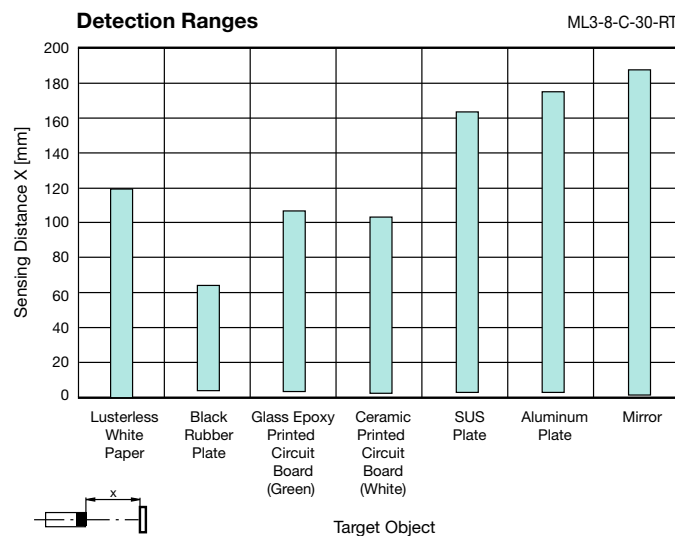
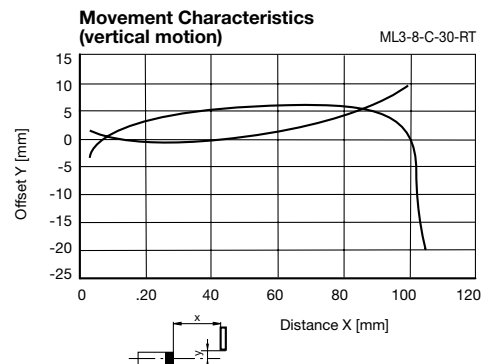
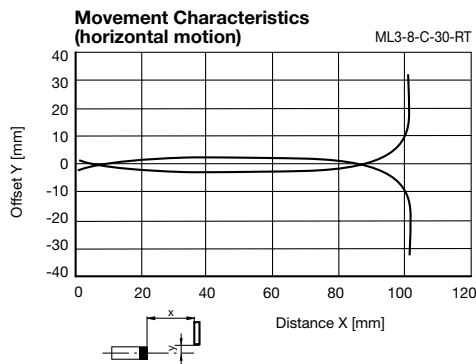
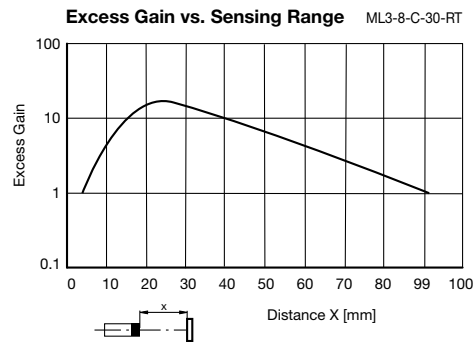
- ⚡ Stocked item
- Typical delivery 4 weeks or less
Consult factory for all other models

*See dimensional drawings for LED functions.



Convergent Beam Mode

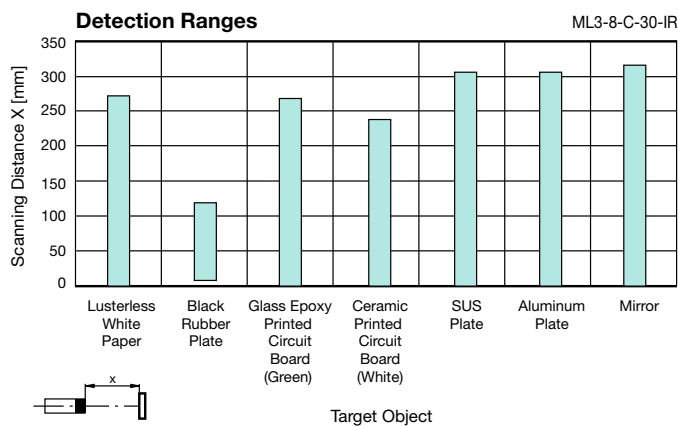
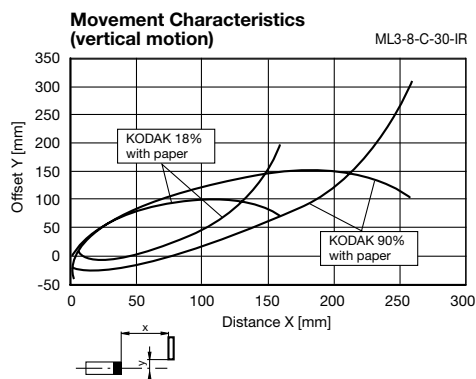
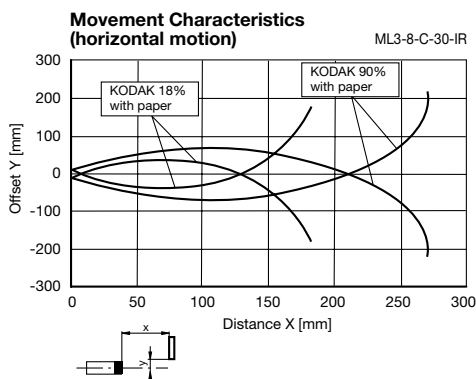
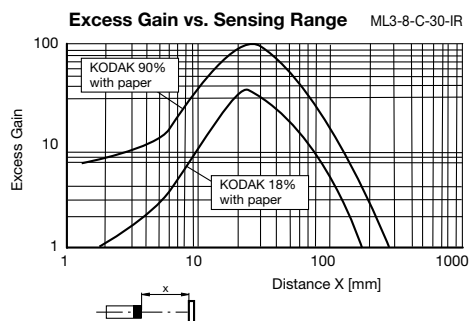
Sensing Characteristics

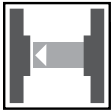




Convergent Beam Mode

Sensing Characteristics



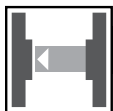


Thru-Beam Mode

Specifications				
SENSING RANGE		0-1.5 m	0-1.5 m	0-1.5 m
SENSITIVITY ADJUSTMENT		No	No	No
DIRECTIONAL MOUNTING		Horizontal	Vertical	Vertical
MODEL NUMBER(S)	Transmitter	M31/115	M3/115 ⚡	M3/115 ⚡
	Receiver	MV31/59/115/148	MV3/59/115/148 ⚡	MV3/25/115/148
		—	MV3/59/115/149	—
OUTPUT: Transistor, Open collector		/148	1 NPN	1 NPN
		/149	—	1 PNP
LOAD CURRENT		100 mA max.	100 mA max.	100 mA max.
VOLTAGE DROP		1 VDC	1 VDC	1 VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION		No	No	No
REVERSE POLARITY PROTECTION		Yes	Yes	Yes
SUPPLY VOLTAGE		10.8-26.4 VDC	10.8-26.4 VDC	10.8-26.4 VDC
VOLTAGE RIPPLE		10% max.	10% max.	10% max.
LED(s)		Yes (1)*	Yes (1)*	Yes (1)*
CURRENT CONSUMPTION		≤ 40 mA	≤ 40 mA	≤ 40 mA
OPERATING MODE		Dark on	Dark on	Light on
RESPONSE TIME		≤ 1 ms	≤ 1 ms	≤ 1 ms
SWITCHING FREQUENCY		500 Hz	500 Hz	500 Hz
PROTECTION (IEC)		IP40	IP40	IP40
LIGHT SOURCE		Infrared LED	Infrared LED	Infrared LED
AMBIENT LIGHT RESISTANCE		≤ 10,000 lux	≤ 10,000 lux	≤ 10,000 lux
TEMPERATURE RANGE	WORKING	-4 °F to +122 °F	-4 °F to +122 °F	-4 °F to +122 °F
	STORAGE	-40 °F to +158 °F	-40 °F to +158 °F	-40 °F to +158 °F
HOUSING MATERIAL		Polycarbonate	Polycarbonate	Polycarbonate
LENS		Polycarbonate	Polycarbonate	Polycarbonate
WEIGHT		≈ 0.7 oz (per housing)	≈ 0.7 oz (per housing)	≈ 0.7 oz (per housing)
STANDARDS		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
APPROVALS		CE	CE	CE
ELECTRICAL CONNECTION		2-meter cable, PVC covered, 3-conductor, #28 AWG	2-meter cable, PVC covered, 3-conductor, #28 AWG	2-meter cable, PVC covered, 3-conductor, #28 AWG
ADDITIONAL DATA		See pages 439-440		

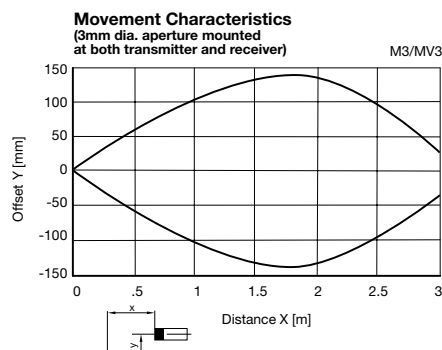
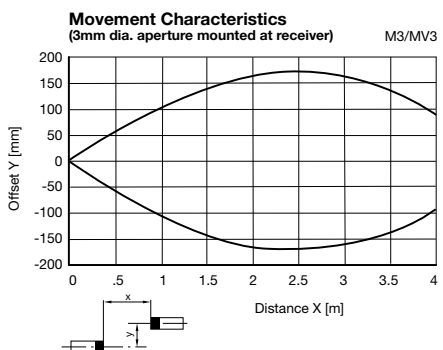
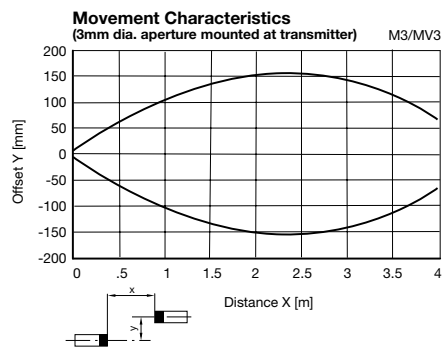
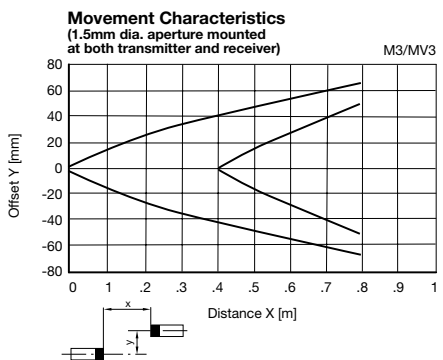
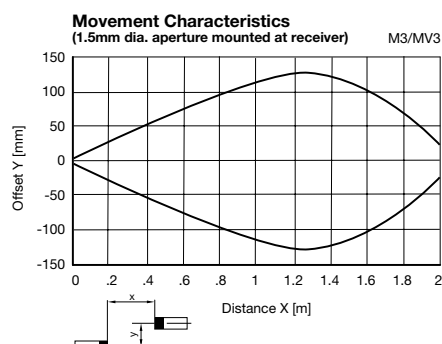
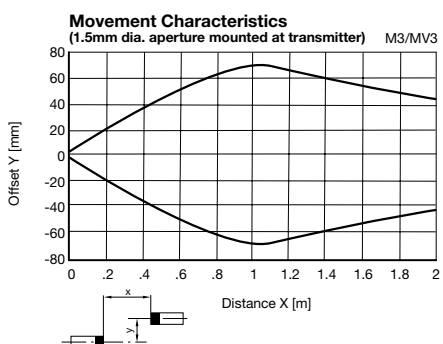
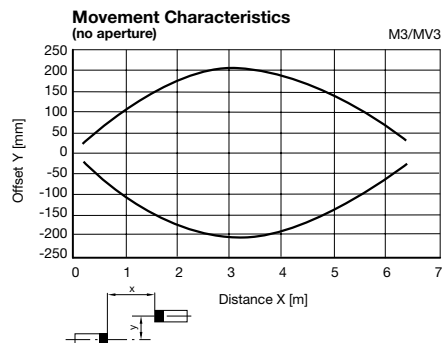
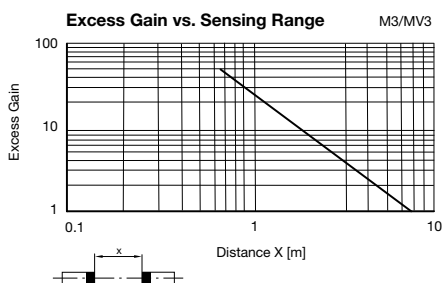
*See dimensional drawings for LED functions.

- ⚡ Stocked item
 - Typical delivery 4 weeks or less
- Consult factory for all other models



Thru-Beam Mode

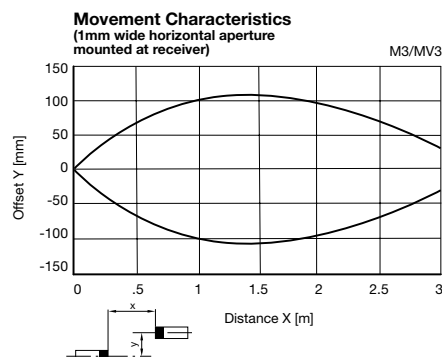
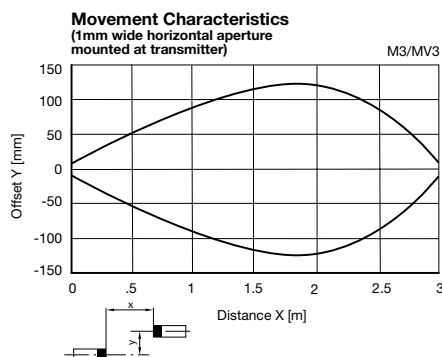
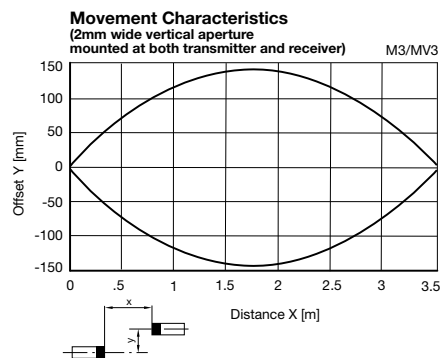
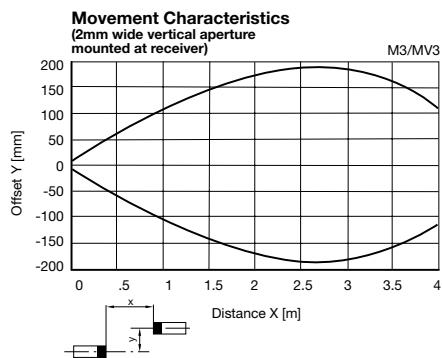
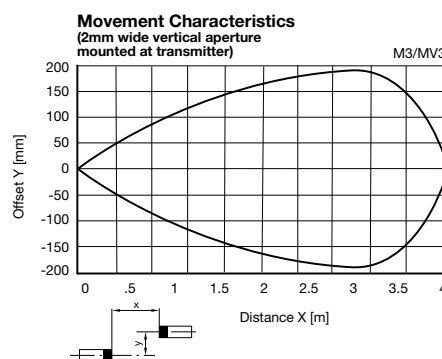
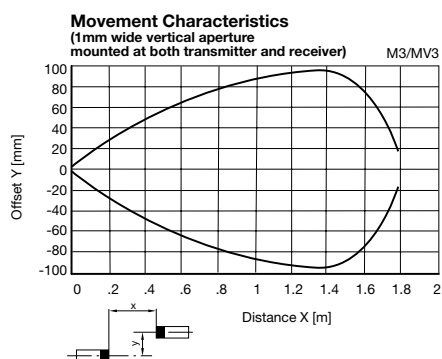
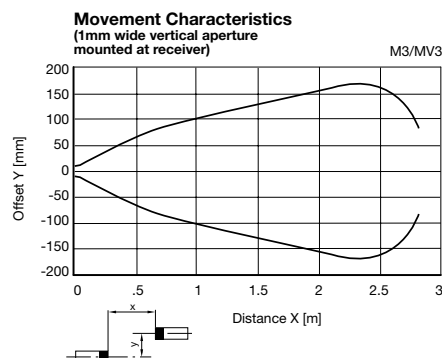
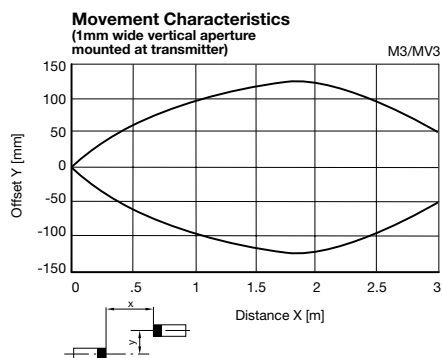
Sensing Characteristics

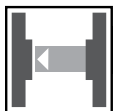




Thru-Beam Mode

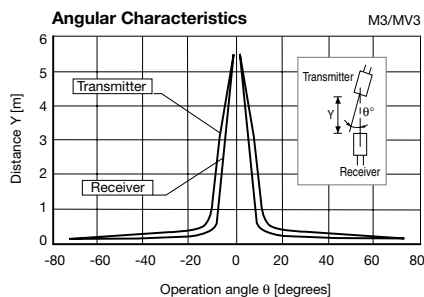
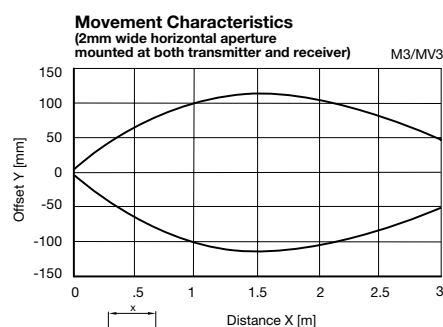
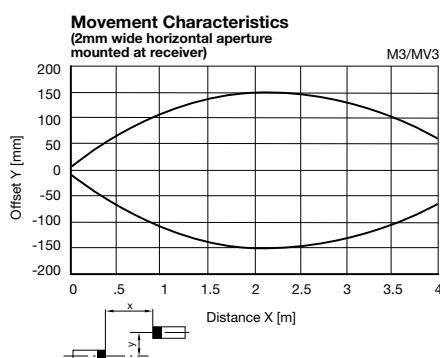
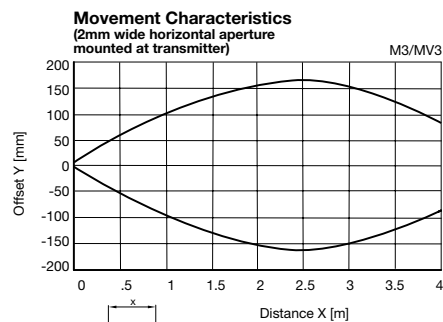
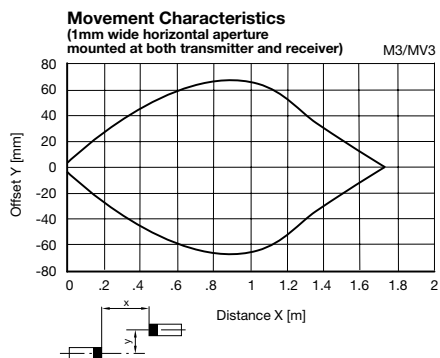
Sensing Characteristics





Thru-Beam Mode

Characteristic diagrams thru-beam



Scanning Distance Characteristics (Typical Value) when Aperture ML3-U01 Is Attached (Comparison with aperture not attached)

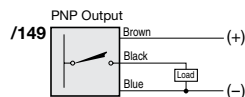
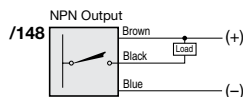
Type of Aperture	Used on Transmitter	Use on Transmitter or Receiver
No aperture	100%	100%
1.5 mm	5%	30%
3 mm	40%	60%
1 mm wide horizontal	20%	40%
2 mm wide horizontal	40%	60%
1 mm wide vertical	20%	40%
2 mm wide vertical	40%	60%

Wiring Diagrams

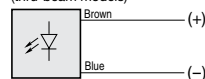
DC



Cable Connection



Transmitter (thru-beam models)

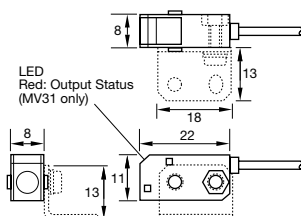


Dimensions (mm)

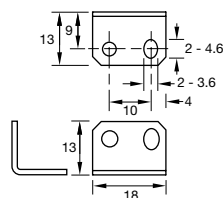
Mounting Dimension (For reference only)

M31/115 MV31/59/115/148

Horizontal type — supplied with bracket OMH-ML3-1

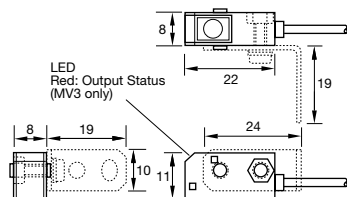


Bracket OMH-ML3-1

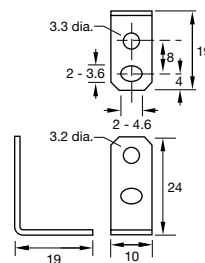


M3/115 MV3/59/115/148 MV3/59/115/149 MV3/25/115/148

Vertical type — supplied with bracket OMH-ML3

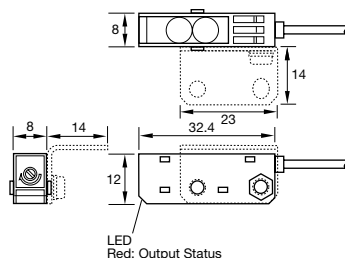


Bracket OMH-ML3

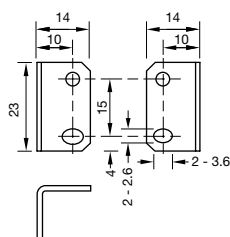


ML3-8-C-30-RT/25/115/148 ML3-8-C-30-RT/25/115/149 ML3-8-C-30-IR/25/115/148

Supplied with bracket OMH-ML3-2



Bracket OMH-ML3-2

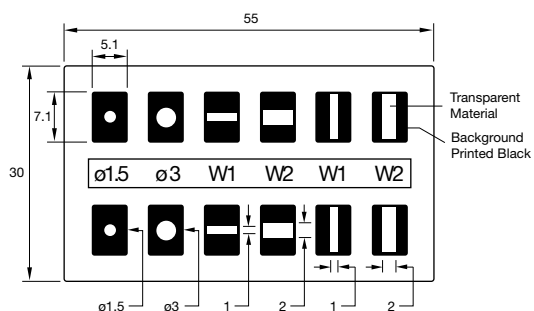


Accessories

(Dimensions in mm)

Aperture ML3-U01

Attachable on thru-beam (self-adhesive)



See pages 865-872
for additional
accessories